Appl. No. 10/661,154
Amdt. dated October 26, 2005
Reply to Office Action of July 26, 2005

PATENT

REMARKS/ARGUMENTS

Claims 5-7 and 20-32 are pending. Claims 1-4 and 8-19 have been canceled without prejudice and without disclaimer. Claims 5 and 6 have been amended. New claims 21-32 have been added. Support for the claims can be found, for instance, in Fig. 1 and in the specification at page 6, line 17 to page 7, line 1; page 19, lines 5-14; page 12, lines 23-28; and page 13, line 23 to page 14, line 15. Similar to the original claims, the new claims are directed to a Fiber Channel network device (controller) having a Fiber Channel switch, receiving an input command sent from a host computer to a port of the Fiber Channel network device, and relaying data of the input command from a host computer to a disk array system based on cracking the input command. No new matter has been introduced. Applicants believe the claims comply with 35 U.S.C. § 112.

Applicants note with appreciation the allowance of claim 20 and the indicated allowability of claims 5-7 if rewritten in independent form including all the limitations of the base claim and any intervening claims. Claims 5 and 6 have been rewritten in independent form. Claim 7 depends from claim 6. Accordingly, claims 5-7 are allowable.

Applicants respectfully submit that new independent claim 21 is patentable over the cited references because, for instance, they do not teach or suggest that the Fiber Channel switching module relays the data of the input command to the disk array system without transferring the data of the input command to the controlling module, if the Fiber Channel switching module receives the input command.

Applicants respectfully submit that new independent claim 23 is patentable over the cited references because, for instance, they do not teach or suggest that the Fiber Channel switching module relays the data of the input command to the first or second disk array systems without transferring the data of the input command to the controlling module, if the Fiber Channel switching module receives the input command.

Applicants respectfully submit that new independent claim 25 is patentable over the cited references because, for instance, they do not teach or suggest that the Fiber Channel switching device relays the data of the write access request to the first disk array system without

transferring the data of the write access request to the controlling device, if the Fiber Channel switching device receives the write access request.

Applicants respectfully submit that new independent claim 29 is patentable over the cited references because, for instance, they do not teach or suggest that the Fiber Channel switching device relays the data of the access request to the first disk array system without transferring the data of the access request to the controlling device, if the Fiber Channel switching device receives the access request.

U.S. Patent No. 6,108,748 to Ofek et al. (Ofek'748) discloses a Data Map 24, which is used for a transparent data migration from an existing storage device to a replacement storage device. The existing storage device generates a read request based on a read command sent from the CPU/HOST 12 and sends the read request to the replacement storage device (see Fig. 3, steps 101, 102 and 106). The Data Map 24, however, does not have any information of a virtual volume and is not used to relay an input command sent from a host computer. In Ofek'748, data of a write request sent from the CPU/HOST 12 are not relayed to the replacement storage device (see Fig. 3, steps 120, 122, 124, 126, 128 and 130). Furthermore, Ofek'748 does not disclose a Fiber Channel switching module, which has at least one first processor and controls to relay data of an input command from a first port to a second port selected among a plurality of ports based on cracking and the map.

U.S. Patent No. 6,044,444 to Ofek (Ofek'444) discloses a plurality of Repeaters 307, 308, 310, and 311. The Repeaters, however, are not a Fiber Channel switching module, which has at least one first processor and controls to relay data of an input command from a first port to a second port selected among a plurality of ports based on cracking and the map.

In sum, both Ofek'748 and Ofek'444 fail to teach the following:

(1) A virtual volume is related to a logical volume transparently for the host computer and is a target volume of an input command sent from the host computer.

(2) A map has information of between the virtual volume and the logical volume.

(3) A Fiber Channel switching module and a controlling module are in a network switch.

(4) The Fiber Channel switching module has at least one first processor, which is different from at least one second processor in the controlling module, and controls to relay data of the input

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command from a first port to a second port selected among a plurality of ports based on cracking and the map.

(5) The Fiber Channel switching module relays the data of the input command to a disk array systems without transferring the data of the input command to the controlling module, if the Fiber Channel switching module receives the input command.

For at least the foregoing reasons, Applicants respectfully assert that independent claims 21, 23, 25, and 29, and claims 22, 24, 26-28, and 30-32 depending therefrom, are patentable.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

Chun-Pok Leung
Reg. No. 41,405

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 650-326-2400
Fax: 415-576-0300
RL:rl
60618709 v1